CROPS STRATEGY
for MANITOBA

Manitoba
Agriculture

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Introduction

The soils and climate of Manitoba provide a favourable environment for the production of a wide range of crops. The production of cereals, oilseeds and special crops is the major source of income for a majority of Manitoba's farmers.

This strategy identifies various requirements of modern crop production and recommends appropriate action for improving the economic situation of the agricultural community in Manitoba. The broad areas of Production and Marketing are discussed, with particular emphasis on Research and Development, and Technology Transfer.

Background

The area devoted to annual cropping in Manitoba is about 10 million acres. In 1985, approximately $1.5 billion, 62% of total farm income was derived from the production and sale of these crops. Of this value, approximately two-thirds entered the export market with the remainder used domestically. In addition to markets for grains, processing provides secondary products for sale into both the domestic and export markets. The handling and processing of grains and grain products provides employment in the transportation, food, beverage, animal feed and manufacturing sectors. A highly developed agribusiness industry provides fertilizers, pesticides, fuel, farm machinery and parts in support of Manitoba's grain farmers in all regions of the province.

On the marketing side, Winnipeg is a major centre in Western Canada for the grain trade, including the Canadian Wheat Board, the Canadian Grain Commission, the Winnipeg Commodity Exchange, and head offices of several grain trading companies, and major banking services. Several firms process special crops in the Winnipeg area. Wheat and oat milling, and barley malting, are important industries.

Manitoba has two large oilseed crushing plants, three breweries, two distilleries, and special crops processing, packaging and distribution firms. These commercial operations are a significant asset for the crop production sector of agriculture in Manitoba.

Manitoba has a well developed transportation system of railroads, highways and secondary roads. Most farmers have ready access to grain elevators, seed plants and service centres. Continued rationalization of the elevator system will require additional upgrading of both road and rail systems.

The family farm is the basis of agricultural production in Manitoba. However, declining commodity prices, the high costs of farm capital, loss in farm equity and poor cash flow are threatening the financial stability of some of these farms. The potential loss of young innovative farmers is of serious concern.

The current high level subsidies being paid to producers of grains, oilseeds and certain special crops in EEC countries, are seriously depressing commodity prices in the world market. An in-depth study to determine the short and long term effect of these policies on world commodity prices is urgently required.

Increasing yields in recent years have been attained through higher levels of input and improved management, taking advantage of Manitoba's generally favourable soils and climate. This increase in productivity has been accompanied by increasing problems with pests and disease. The cost of controlling these problems adds to the financial difficulties of farmers. It is essential that both public and private funding for the development of improved disease and pest control measures, disease resistant varieties, and other production oriented research be continued.

To maintain a high level of productivity, soils must be protected from degradation. The issue of recommending the burning or burying of crop residue for insect, weed and disease control, is in direct conflict with sound soil conservation management. Research and demonstration of practices integrating soil conservation with crop production is required. Continual fertility research is also needed to improve the efficiency of fertilizer use. There is also a need to demonstrate on-farm drainage and its value in reducing risk in crop production.

Objectives

The objective contained within the strategy is to maintain and improve the economic and social returns to the family farm and the agricultural community from the production, marketing and processing of cereals, oilseeds and special crops.

1. Enhance the efficiency of production and net returns to farmers through improvements, both short and long term, in crop production.
2. Enhance the transfer of production and marketing technology to farmers, to improve productivity and the understanding and use of marketing options.
3. Identify and establish new and expanded markets for crops and derived products with emphasis on the quality and supply guarantees required by the market place.
4. Initiate an in-depth study into the short and long term effect of EEC policies on prices received for crops in Manitoba.
5. Integrate soil conservation and crop management practices to ensure protection of the soil resource.
6. Identify and conduct the required research relating to crop production, processing and marketing.
7. Integrate the crops strategy with strategies and programs developed by other sections of Manitoba Agriculture (e.g. Marketing Branch), Agriculture Canada and other agencies.

Implementation

I Production

Opportunities exist for the continued development of crop production by improving management practices on established crops and the introduction of new crops. The emphasis should be on maximizing economic yields and the integration of productivity and soil conservation.

To achieve this, the following research needs have been identified:

A. Research and Development

(1) Develop economic thresholds in relation to use of pest management technology, including reduced rates, rotations and biological control, and specifically investigate the relationships between crop diseases and fertility levels.

(2) Determine the most economic use of fertilizer with particular emphasis upon placement, timing of application and rates. The research should relate fertility to the different soil types, soil moisture categories, as well as to new varieties e.g. semi-dwarfs.

(3) Investigate the effect of crop type and cropping sequences on soil degradation, and develop recommendations for residue handling and tillage practices.

(4) Identify superior varieties with emphasis on regional adaptation, suitability for problem soils, and identification of varieties responding economically to varied levels of input.

(5) Improve the reliability of variety performance information by annually testing all recommended varieties at regional sites under the Agri-Food Variety Evaluation Project.

(6) Screening of new crops and determining management techniques.

(7) Research into improved equipment and systems for reduced tillage, crop residue distribution, seed and fertilizer placement, inoculum application and straight combining.

(8) Develop quackgrass control programs suitable for cereal and oilseed production, and determine yield losses caused by weed competition in semi-dwarf cereal varieties.

(9) Increase research and promote herbicide registration for small acreage crops, to ensure inclusion of these crops on product labels (e.g. wild mustard control in sunflowers and buckwheat).

(10) Obtain more precise information on the risk caused by weather (additional agro-met stations), as it affects crop choice; and other management decisions within specific regions based on improved weather forecasting.

(11) Encourage the federal and provincial government to establish acceptable tolerance levels for chemical and fertilizer residues in air, soil and water.

(12) Assist in the development of cultural practices for organic farming.

As the results of research become available, it is essential to transfer this information to producers.

B. Technology Transfer

(1) Increase the effectiveness of information transfer through preparation of additional crop manuals, more extensive use of the media, and home-study courses.

(2) Provide additional support for agricultural representatives and farm management specialists working with producers in financial

difficulty, through supplying specific technical information where required.

(3) Additional emphasis on the integration of soil management and conservation methods with recommended crop production practices, through special mention in extension bulletins, production meetings and demonstrations.

(4) Increase the scope of variety performance information to the producer by including up-to-date research results on regional adaptation, and on economic responses to varied levels of input.

(5) Demonstrate on a field scale the management practices required to maximize economic returns.

(6) Field scale demonstration of appropriate production practices for new crops showing potential for economic returns.

(7) Develop closer working relationships with agri-business in transfering production and marketing information to producers. This will assist in providing continuity of supply for commodities that have a well established market.

II Marketing

There are opportunities to expand the range of crops or crop products which could be exported, but the need also exists to better determine the product requirements of inporting countries. The major portion of Manitoba's crop production enters the export market. This exposes farmers to the effects of depressed world commodity prices. Therefore farmers need the best possible market information and assistance to take advantage of market alternatives.

The following items need to be addressed:

A. Research and Development

(1) Develop new and expanded domestic and export markets for existing and potential crops and for products derived from these crops, through the work of the Manitoba Agriculture Marketing Branch.

(2) Develop new food products for both the domestic and export markets, through increased support of the relevant University Departments and the Food Development Centre (Portage la Prairie).

(3) Strengthen liaison between the Marketing Branch, exporting

companies, and domestic and overseas buyers, to increase the flow of Manitoba products to market.

(4) Identify precise quality requirements of specific export markets for oilseeds and special crops.

(5) Ensure maximum use of federal government export incentives to enhance the competitiveness of Manitoba's products in export markets; encourange CIDA to include larger quantities of Manitoba grown pulses in the foreign food aid program.

Information on market opportunities and marketing methods must be made available to Manitoba's producers to assist in farm business decisions.

B. Technology Transfer

(1) Initiate programs at the agricultural district level to familiarize producers with the benefits and risks of crop marketing options (e.g. CWB, contract crops, forward pricing, hedging), through marketing clubs, farm business clubs, seminars and workshops including work with simulated marketing situations.

(2) Increase the availability of information on markets and market trends to producers by actively promoting the weekly market report, and other market oriented information providers.

III Other Issues of Concern

There are other areas of concern which have a significant impact on the future stability of the agricultural industry in Manitoba. Some of these include:

1. Problems related to the delivery and transportation of Manitoba products to market e.g. rail line abandonment, highway upgrading, labour disputes.
2. Addressing the potential problem of rising transportation costs related to Manitoba's geographic location.
3. Better understanding of the implications to Manitoba of international trade issues such as EEC subsidies, U.S. farm bill, Japanese import quotas, etc.
4. Alleviate financial pressures on producers caused by loss in farm equity and low commodity prices.
5. Request the federal government to develop policies which lead to a shorter duration of patents.

Implementation Plan for Crops Strategy

In order to achieve the objectives outlined in this strategy, the following implementation activities relating to production and marketing are planned during the next two year period:

(1) During March, April, and May, 1987, present the Crops Strategy to producer groups, agri-business firms and other agencies for review and input, through both central and regional staff.

(2) By May 30, 1987, approach the respective sections dealing with weeds, insects, disease, and fertility, to determine what economic thresholds have been developed, and which thresholds need to be developed.

(3) Contact the Soil Fertility Group, and determine what research has been initiated pertaining to fertilizer placement, timing of application and rates, and what further research is required.

(4) By May 30, 1987, organize a Working Team composed of representation from the Crops Strategy Group and Soil Strategy Group to:

   (i) Approach the Departments of Plant Science, Soil Science, and Agricultural Engineering at the University of Manitoba, and Agriculture Canada for the purpose of initiating co-ordinated research relating to the long term effect of crop type and cropping sequences on soil degradation, with particular attention on pest management.

   (ii) Approach the Department of Agricultural Engineering at the University of Manitoba for purpose of developing a plan of action to deal with the problems encountered with equipment in controlling seeding depth, fertilizer placement, crop residue distribution, ground sprayer application of fungicides, as well as the green seed problem and drying of crop following straight combining.

(5) Communicate to the Weeds Group, the high importance that the Crops Strategy attaches to their ongoing work pertaining to:
   (a) development of quackgrass control programs in cereal and oilseed production.

   (b) yield losses caused by weed competition in semi-dwarf cereal varieties.

(c) herbicide registration for small acreage crops.

(6) Approach the Department of Soil Science, University of Manitoba to discuss the adequacy of the present Environment Canada weather stations and the adequacy of the data collected. If additional weather stations are required, request Environment Canada to establish them. Increased climatic data will be utilized in developing more precise risk projections for crop production in various areas of rural Manitoba.

(7) By May 30, 1987, establish an interdisciplinary group from the Crops, Soils, and Weeds Section, as well as Technical Services, to gather information currently available on cultural practices for organic farming, and recommend appropriate research projects for information that is lacking.

(8) In the next 3 - 6 months, ensure that manuals on Flax Production, Mustard Production, and Optimum Crop Management are made available. Also, prepare a Home Study Course for Wheat, Barley, Flax and Canola for January, 1988.

(9) By mid-April, approach the Project Leader to discuss the possibility on integrating demonstrations of soil management and conservation methods with recommended crop production practices, into the 9 established tillage sites under the Agri-Food Soil Conservation Projects.

(10) Convey the need for development of new and expanded domestic and export markets to the Special Crops Market Development Officer in the Manitoba Agriculture Marketing Branch. Point out the need for stronger liaison between the Marketing Branch, exporting companies, and domestic and overseas buyers. Recommend on-going market research to determine the precise quality requirements desired in specific export markets.

(11) Within the next 3 months, have the Special Crops Agronomist of the Crops Section liaise with respective University Departments and the Food Development Centre with the purpose of stimulating more action in the development of new food products.

(12) Request the Special Crops Marketing Development officer of the Marketing Branch to investigate the federal government export incentives available, and ensure maximum use of the available incentives.

(13) During the period of November, 1987 to April, 1988, increase the regional emphasis on familiarizing producers with crop marketing options through seminars, workshops, and other forms of technology transfer.

(14) Within the next 3 month period, the Team Leader will contact the Director of the Economics Branch, to request active promotion of making the weekly market report available to producers.

(15) Request the Director of the Economics Branch to have information prepared on the short and long term effect of EEC subsidies, U.S. farm bill, andJapanese import quotas on the marketing of Manitoba products. Broadly distribute this information to departmental staff and the farming public through workshops and seminars.

(16) Request the Provincial Transportation Authority to improve the communication of information pertaining to problems in transporting Manitoba products to market, and the problem of rising transportation costs, to departmental staff.

EVALUATION PLAN

The evaluation of the Crops Strategy depends on achieving some measurable progress towards the objective established for the strategy. The carrying out of specific activities and gathering information related to these activities will allow results statements to be made in relation to meeting the objective and goals.

Objective:

To maintain and improve the economic and social returns to the family farm and the agricultural community from the production, marketing and processing of cereals, oilseeds and special crops through activities which:

1. Enhance the efficiency of production and net returns to farmers
2. Enhance the transfer of production and marketing technology to farmers, to improve productivity and the understanding and use of marketing options
3. Identify and establish new and expanded markets for crops and derived products with emphasis on quality and supply guarantees required by the market place
4. Initiate an indepth study into the short and long term effect of EEC policies on prices received for crops in Manitoba
5. Integrate soil conservation and crop management practices to ensure protection of the soil resource
6. Identify and conduct the required research relating to crop production, processing and marketing
7. Integrate the crops strategy with strategies and programs developed by other sectors of Manitoba Agriculture, Agriculture Canada and other agencies.

Activities To Implement the Strategy and Achieve the Objective:

1. Production Research and Development
2. Production Technology Transfer
3. Market Research and Development
4. Market Technology Transfer
5. Improving Knowledge of Forces Outside of Manitoba Agriculture

Affecting Farm Income

Monthly reports of statistics and narrative should provide accumulating information with respect to the activities and sub-activities carried out to achieve the results desired in the objectives and goals and which will allow the development of results statements to those farmers and farm families receiving assistance and counselling by the department.

Information will be reported with respect to implementation progress of the following activities and sub-activities which are stated in the strategy:

Production Research and Development

1) Development of Economic Thresholds for Use in Weed Control, Disease Control and Insect Control

a) Weed Control

i) Green foxtail

- to develop by 1992 in conjunction with Agriculture Canada and University of Manitoba, economic yield loss information from green foxtail infestations in wheat and barley, based on competition studies from North Dakota.
- the information will be developed by Manitoba Agriculture in factsheet and computerized form for direct use by farmers.
- the program to be tested in the 1992 season: progress in program development to be monitored and reported annually by the Weeds Section.

ii) Volunteer cereal control

- to develop by 1990, economic yield loss information from volunteer wheat, barley and oats infestations in flax and canola, from model developed in Alberta.
- information will be developed by Manitoba Agriculture in factsheet and computerized form for direct use by farmers.
- the program to be tested in 1990 season; progress in program development to be monitored and reported annually by the Weeds Section.

b) Disease Control

i) Leaf Disease Control

- to develop recommendations for leaf disease control in wheat and barley by 1990 through regional demonstration program under direction of the Optimum Crop Management Committee.

- information will be developed by OCM Committee and published in factsheet form by Manitoba Agriculture, and be included in the 1991 Crop Production Guide for use by producers.
- the program will be monitored and reported annually by the OCM Committee.

ii) Sclerotinia Disease Forecasting

- to establish an on-farm test for Sclerotinia disease forecasting in canola by Manitoba Agriculture in conjunction with University of Manitoba, from process developed at the Crop Development Centre (Saskatoon).
- a factsheet to be developed by Manitoba Agriculture and information to be added into 1991 Production Guide for use by producers.
- progress report to be provided by provincial pathologist on annual basis.

iii) Reduced Rate Fungicide Application

- to test reduced rates and alternative methods of fungicide application in field beans by Manitoba Agriculture in conjunction with the University of Manitoba.
- a factsheet to be prepared by Manitoba Agriculture for 1990, and information to be included in Field Crop Production Guide for 1991.
- the progress of the program will be reported annually by the Manitoba Agriculture plant pathologist.

iv) Ascochyta Control

- to identify effective seed treatments and foliar sprays for economic control of Ascochyta in lentils and field peas through co-operative effort of Manitoba Agriculture plant pathologist, the Manitoba Pulse Growers Association, and the chemical industry.
- the recommendations will be included in the 1991 Field Crop Production Guide and in revised editions of the lentil and field pea production booklets.
- the progress of the program will be reported annually by the Manitoba Agriculture plant pathologist.

c) Insect Control

i) Economic Thresholds

- to revise the economic threshold recommendations for aphids on flax and canaryseed, armyworms on cereals, and cutworms in a range of crops. Personnel of Manitoba Agriculture Entomology Section, Agriculture Canada, and University of Manitoba will co-operate in this project.

- the revised economic thresholds to be published in the 1989 Insect Control Guide.

ii) Insect Seed Perforation Damage in Field Peas and Fababeans

- to sample insect populations in fields of peas and fababeans and identify the insects causing seed perforation; to make recommendations for economic control of these insects.

- the control measures developed with information on economic thresholds will be included in the 1991 Insect Control Guide.

- the progress of the program will be reported annually by the Manitoba Agriculture Entomology Section.

2) Economic Use and Placement of Fertilizer

i) - to develop recommendations for the timing and placement of anhydrous ammonia in cereals and canola through a co-operative program between Manitoba Agriculture and the University of Manitoba under the Agri-Food agreement.

- a factsheet to be prepared by Manitoba Agriculture, and the information to be included in the 1991 Field Crop Production Guide for Manitoba.

- progress in development of recommendations to be reported annually by the Manitoba Agriculture Soils Specialist.

ii) - to develop nitrogen fertilization recommendations for semi-dwarf wheat varieties through research work being conducted by the Brandon Research Station.

- a factsheet will be prepared by Manitoba Agriculture in co-operation with Agriculture Canada and the information to be included in the 1991 Crop Production Guide for Manitoba.

- progress will be reported annually by the soil scientists at the Brandon Research Station.

iii) - to develop specific recommendations for micro-nutrients, sulphur, potash and phosphate applications in both mineral and peat soils, through work at the Brandon Research Station and University of Manitoba.

- factsheets to be prepared by Manitoba Agriculture in co-operation with Agriculture Canada and the University of Manitoba by 1991.

3) Effect of Crop Type, Cropping Sequence and Tillage Operations on Soil Degradation

- to develop recommendations for appropriate tillage practices for different crop types and cropping sequences, with emphasis on protection of the soil from wind erosion, through co-operation between Manitoba Agriculture and University of Manitoba.

- a brochure to be prepared by Manitoba Agriculture once sufficient data from a long term study has been developed.

- progress in development of recommendations to be provided annually by the Manitoba Agriculture Soil and Water Section.

4) Identification of Superior Varieties

- to determine the number of test sites required to provide reliable variety performance information, recognizing crop and variety adaptation within the different regions of Manitoba, using information reported by the Agri-Food Variety Evaluation Trials in previous years. To be undertaken by the Department of Plant Science, University of Manitoba.

- report and recommendation to be prepared in time for meeting of the Technical Committee of the Agri-Food Variety Evaluation Project to be held in early 1989.

5) Annual Testing of All Recommended Varieties

- to provide reliable performance data through testing of all varieties recommended in Manitoba and to demonstrate the agronomic characteristics of all varieties recommended at all test sites under the Agri-Food Variety Evaluation Project conducted by the Department of Plant Science, University of Manitoba (this goal to be worked out in conjunction with results of No. 4).

- were all recommended varieties tested at all sites within the area of adaptation for each crop?

6) Screening New Crops

- to identify new crops that have potential for production in Manitoba, through screening of introductions by the Crops Section, Manitoba Agriculture (Brandon) in conjunction with the Morden and Brandon Research Stations of Agriculture Canada, and to develop management packages for those crops showing good adaptation and market opportunity.
- when new crops with potential for production in Manitoba are identified, factsheets including management information will be developed by Manitoba Agriculture.
- progress on development of new crops to be reported annually by the New Crops Agronomist.

7) Research into Improved Equipment and Systems for Reduced Tillage

- to develop improved equipment for reduced tillage including straw choppers and modified seed drills (fertilizer placement) through work at the Department of Agricultural Engineering at the University of Manitoba in conjunction with Manitoba Agriculture.
- when the equipment improvements have been developed, the information will be publicized through factsheets prepared by Manitoba Agriculture.
- progress in equipment modifications to be reported annually by Manitoba Agriculture Agricultural Engineer.

8) Development of Quackgrass Control Programs

- to maintain research on chemical control of quackgrass in cereals, oilseeds and special crops at the Department of Plant Science, University of Manitoba in conjunction with Manitoba Agriculture.
- registration of new products and information on product use will be included in factsheets and Guide to Chemical Weed Control.
- progress toward registration of new products to be reported annually by the Weeds Section of Manitoba Agriculture.

9) Herbicide Registration for Small Acreage Crops

- to ensure that necessary research work and subsequent promotion of registration application is undertaken for smaller acreage crops through co-operation of Manitoba Agriculture, University of Manitoba, Agriculture Canada (Morden) and chemical companies.
- that registration of herbicides for smaller acreage crops is granted as quickly as possible (examples: wild mustard control in sunflowers - Assert;

wild mustard control in buckwheat).

- progress in registration of products to be reported annually by Weeds Section.

10) Impact of Weather on Cropping Choice
- that more complete weather information be made available to enable farmers to make better cropping choices through expansion and updating of the brochure "Manitoba's Climate and Agriculture" by the Department of Soil Science, University of Manitoba, in conjunction with the Soil and Water Section of Manitoba Agriculture.
- that the brochure is expanded and republished by January, 1990.
- Soil and Water Section to report progress by January, 1989.

11) Tolerance Levels for Chemical and Fertilizer Residues in Air, Soil and Water
- to encourage the establishment of tolerance levels for chemical and fertilizer residues in the environment, with initial emphasis on residues in water, through the work of Environment Canada, and the development of water quality guidelines.
- the setting of residue tolerances for all chemical products which are of concern due to their environmental impact.
- progress on work by Environment Canada and other institutions to be reported by the Weeds Section of Manitoba Agriculture Canada on an annual basis.

12) Development of Cultural Practices for Organic Farming
- to identify research needs for crop production under chemical-free conditions (organic farming) through the work of the Soils Specialist, Manitoba Agriculture (Brandon) in consultation with current "organic" farmers.
- a report identifying the research priorities for crop production under organic conditions to be submitted to the Crops Strategy Team by January, 1989.

Production Technology Transfer

1) Preparation of Crop Manuals, Media Use and Homestudy Course
- in addition to the Canola Manual, to produce manuals for flax and mustard production; to prepare a homestudy course for major cereal and oilseed crops for 1988; to take initiative in preparing news releases pertaining to crop production, through the work of Soils and Crops Branch personnel in conjunction with Regional staff.

- all manuals available for distribution by April, 1988; homestudy course complete by March, 1988; production of news releases ongoing.

2) Provision of Technical Information
   - to provide specific technical information to regional farm management staff and agricultural representatives, with particular emphasis on assisting producers in financial difficulty through co-operation of Soils and Crops Branch personnel.
   - specific technical information has been requested and provided, and revised farm management plans have been developed resulting in improved financial situation for specific producers.
   - adequacy of information supplied to agricultural representatives and farm management specialists as reported by Farm Management Section.

3) Integration of Crop Production Requirements with Soil Management Recommendations
   - to develop and demonstrate crop production practices which balance the needs of efficient crop establishment and disease management with the specific requirements for protecting the soil from erosion, through co-operation between Manitoba Agriculture (Soils and Crops Branch and Regional Agronomists), University of Manitoba, P.F.R.A., and producers.
   - that demonstrations have been established on farm fields to illustrate management of particular cropping practices in relation to residue management, including:
     i) residue management on erodible soils, particularly after low residue crops e.g. pulses
     ii) management of diseased stubble
     iii) weed control packages for erodible soils
   - progress report on planned demonstrations to be provided by November, 1988, and annually thereafter.

4) Increased Information on Regional Varietal Adaptation
   - to develop regional recommendations for varieties which show particular adaptation within a region, and to provide information on the economic responses to varied input levels, through the ongoing Agri-Food Variety Evaluation Trials conducted by the Department of Plant Science, University of Manitoba.
   - specific recommendations for regionally adapted varieties to be included in the annual Field Crop Variety Recommendation booklet. A factsheet to be prepared for varieties showing economic response to varied levels of input.

5) Field Scale Demonstrations for Maximizing Economic Returns
   - to demonstrate maximum economic returns in wheat and barley from the application of foliar fungicides and plant growth regulators and varied levels of fertility, through the Agri-Food regional programs.
   - a factsheet to be prepared by Manitoba Agriculture and information to be included in the 1991 Field Crop Production Guide.
   - program results to be reported annually by the regional agronomists and summarized annually by the Optimum Crop Management Committee.

6) Field Scale Demonstrations of New Crops
   - to demonstrate on a field scale, production practices for new crops which have been developed in small plots through the Crops Section of Manitoba Agriculture (Brandon location).
   - the appropriate agronomic practices for new crops to be demonstrated at locations within their area of adaptation.
   - report on new crop field scale demonstrations to be provided annually by the Crops Section.

7) Co-operation with Agri-Business in Technology Transfer
   - to develop a closer working relationship between Manitoba Agriculture and agri-business firms through co-sponsorship of field testing, demonstrations and producer meetings.
   - enumerate field projects and producer meetings co-sponsored within agri-business, and listing of individual companies involved during 1988 and annually thereafter.

Marketing Research and Development

1) Development of New and Expanded Markets
   - to develop new and expanded domestic and export markets through closer working relationship between the Manitoba Agriculture Special Crops Market Development Officer and foreign buying agencies such as the Japanese Buckwheat Miller Association; domestic agencies such as the Federal-Provincial Market Development Committee and the Canola Council of Canada.
   - increased sales and marketing opportunities developed due to closer working relationship of Market Development Officer, foreign buying agencies and domestic agencies.

- market development activities to be reported annually by the Special Crops Marketing Development Officer.

2) Development of New Food Products
   - to strengthen the development of new food products through closer liaison between the Special Crops Agronomist of Manitoba Agriculture, the Department of Food Science and Faculty of Human Ecology, University of Manitoba.
   - new food products developed and available for testing in the commercial market.
   - Special Crops Agronomist to report on food products developed on an annual basis.

3) Stronger Liaison Between Marketing Branch and Special Crops Companies
   - to develop stronger working ties with Canadian special crop exporting firms and with domestic processors to promote increased mearket share for Canadian special crops through co-operation between Manitoba Agriculture Marketing Branch (Special Crops Market Development Officer) and the special crops companies.
   - increased sales and marketing opportunities developed due to co-operative efforts by Market Development Officer and private companies.
   - marketing activities to be reported annually by the Special Crop Market Development Officer.

4) Quality Requirements for the Export Market in Oilseeds and Special Crops
   - the Special Crops Marketing Officer of Manitoba Agriculture to develop strong working ties with export companies through the Canadian Special Crops Association, and with agencies such as the Canola and Flax Councils to assist in identifying the specific quality requirements in export markets.
   - identification of quality requirements and establishment of programs to reflect those demands (grade standards) and/or to initiate research work i.e. (buckwheat quality).
   - Special Crops Marketing Officer to report annually on the progress of identifying quality requirements for specific export markets.

5) Use of Federal Government Export Incentives
   - the Special Crops Marketing Officer to identify and assist in bringing to the attention of marketing agencies, the federal government programs which are available to provide assistance in the export of special crops and products.

- which programs and incentives were identified and which were directly useful to Manitoba companies and processors.
- programs being utilized to be reported by Special Crops Marketing Officer on annual basis.

Market Technology Transfer

1) Familiarizing Producers with Crop Marketing Options
   - to improve the marketing expertise of producers by increasing the number and scope of meetings, seminars and workshops on the benefits and risks of various crop marketing options through regional and district initiatives of Manitoba Agriculture staff.
   - increased number of meetings held in which marketing options were presented to and discussed by producers, as reported by regional staff, plus the establishment of additional marketing clubs.

2. Promotion of Market Information to Producers
   - to increase the amount of market information available to producers through promotion of the weekly Manitoba Agriculture market repot, and active use of other channels of information such as farm newspapers and radio, through activities of the Economics Branch of Manitoba Agriculture.
   - significant increase in the circulation of the weekly market report, and increased rise of the media for supplying market information.
   - amount of increase in market report circulation to be reported in January, 1989.

Improving the Knowledge of Forces Outside Manitoba Agriculture Affecting Farm Income

- to provide information on the effect of EEC subsidies, U.S. farm bill and Japanese import quotas, on the marketing of Manitoba products through activities of the Economics Branch of Manitoba Agriculture.
- up-to-date information to be provided through the weekly market report and through market outlook meetings.

Improved Productivity and Related Income for Farm Families

1) Production Costs and Economic Thresholds
   - to identify the costs per acre saved in input costs through development of economic thresholds for both pesticide applications and fertilizer use through work of the Weeds and Entomology Sections, Plant Pathology Lab, and Soil and Water Section of Manitoba Agriculture.

- savings in cost to be included in factsheets containing economic thresholds information published by relevant sections of Manitoba Agriculture, as the information is developed. (See nos. 1 & 2 under Production Research and Development Section).

2) Value of Reduced Soil Degradation
   - to determine the value to individual farm income of reduced soil degradation as a result of crop types and cropping sequences through studies conducted by the Soil and Water Section of Manitoba Agriculture.
   - information on the impact on individual farm income to be included in the brochure on tillage practices (see No. 3 under Production Research and Development Section).

3) Adoption of Superior Crop Varieties
   - to compute the value to individual farm income from the adoption of superior crop varieties through information gathered by the Crops Section of Manitoba Agriculture.
   - information on the economic advantages of new varieties to be publicized by the Crops Section through news releases and farm meetings.

4) Value of New Crops
   - to evaluate the extent to which new crops are adopted and measure the value of their introduction to individual farmers and the province through economic studies undertaken by the Crops Section in conjunction with the Farm Management Section.
   - economic benefits of new crop introductions to be made known to farmers through news releases and producer meetings.

5) Reducing Production Costs Through Reduced Tillage
   - to determine the cost saving from reducing tillage operations to the minimum necessary for optimum crop production through studies conducted by the Soil and Water Management Section of Manitoba Agriculture.
   - the cost saving information to be included in the factsheets developed for reduced tillage (see No. 7 in Production Research and Development).

6) Impact of New Herbicides on Farm Income
   - to determine the value of new herbicides in increasing net returns per acre and total farm income through information gathered by the Weeds Section of Manitoba Agriculture.
   - information to be distributed through releases and inclusion in "Weed Facts".

7) Impact of Improved Organic Farming Practices on Farm Income
   - to measure the value to organic farmers and the province of improved cultural practices for organic farming once identified and developed by Manitoba Agriculture Soils Specialist at Brandon, in conjunction with the Soils and Crops Branch.
   - information to be made generally available through the development of an appropriate factsheet to be prepared by the Soils and Crops Branch.

8) Value of New and Increased Market Access
   - to measure the value of crops and products sold into new markets and increased market share of existing markets to the province through the activities of Manitoba Agriculture Marketing Branch.
   - the information to be included in the annual report of the Marketing Branch.

9) Increased Knowledge of Crop Marketing
   - to determine the extent to which farmers have increased their ability to use additional information in crop marketing.
   - number of producers participating in marketing seminars, workshops, and marketing clubs to be reported by Regional staff of Manitoba Agriculture.

10) Management Strategies and Economic Returns
   - to determine the extent to which farmers are developing improved management strategies to maximize economic returns through participation in "Crops Clubs" in Manitoba.
   - number of producers actively partipating in Crops Clubs and showing increased economic returns from the adoption of improved management strategies as reported by Regional staff.